

AVIATION WEEK

AUG. 15, 1949

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These new nuts shown above on the tail cone flanges of the General Electric TD-110 retain their strength and locking torque characteristics even after exposure at 1200°F. They are readily removed . . . do not seize the bolt as change the threads.

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Clipper Seal is used on one of the most critical mechanical details of this General Electric (JRAF J47) engine for thrust, speed, maneuverability. J M seal seals against shaft and transmits bearing loads to the shaft and the engine housing.

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For example, Clipper Seals are flexible—which means plenty of give and take for maintaining a tight seal even under the most severe operating conditions.

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Jet Transport Rush

Some U. S. engineers were as "I told you so" last, these days as a result of the first flight of the so-called General jet aircraft. Ready, and able to produce a jet transport any time during the past three or four years, these designers have been frustrated by economic factors, which have kept aircraft companies from building a jet transport with sufficient haste to begin it.

Now they expect a sudden rush of orders for such a transport with constant pressure for quick action and the old mad race to beat the competition into the air.

The "Big Four" companies in U. S. transport development are hastily dusting off plans for a closer look. Oddly, on Convair as first in the air with a jet version of its Lancer and Lockheed as first with a designed for the purpose jet transport.

Jet Traffic Problem

Still unsolved is the problem of airway traffic at main airports for more efficient handling, so that jet transports will not be left "holding" at the airport of their destination, burning up vast quantities of fuel until they can be cleared to land. Means of clearing a jet transport to land, almost from the time of its takeoff, will be essential due to the higher speed and shorter time in route.

Thomas Will Not Run

Sen. Elmer Thomas (D., Okla.), chairman of the appropriations subcommittee on the armed services which clipped \$500 million off this year's Air Force budget, will not seek re-election next year. First in line to fill the vacancy which will be created by Thomas is Sen. Richard Russell (D., Ga.), generally considered the next in line. Next is Sen. Phil McClellan (D., Nev.), a strong Air Force advocate. There is some speculation that Civil Aeronautics Board member Jack Lee, defeated for re-election to the Senate in 1942, may seek Thomas' seat. Political observers, however, predict the Democratic nomination will go to Rep. Mike Mansfield (D., Okla.).

Despite some tendency to tilt the Super DC-3 program short, there is a growing feeling in industry quarters that the modernization program for the jet transport will have a rapidly brightening future. Much may depend on Eastern Airlines' acceptance to replace its present DC-3s by long-range transports for its present DC-1. It is expected that the flying prototype will be shown at Cape Canaveral, Fla., in the near future.

As one qualified but unbiased engineering observer puts it: "It's a lot easier to sell somebody a new set of tires for the automobile that has been using and like, than to sell them a new automobile of a different make. And there are more DC-3s and C-47s than there are any other transports."

Fact that the modernized DC-1 will meet the Civil Air Regulations Part 4b wherein the standard DC-1 jet test and the Dec. 31, 1953 deadline for meeting that requirement, are other factors in favor of the Super DC-3.

Super DC-3 Chances

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NEWS SIDELIGHTS

AMC Wings Clipped

As Material Command, procurement agency for USAF, is losing men and more restrictive and responsibility as a result of the National Military Establishment's progress, the Washington observers say. Virtually all important policy decisions are now handled down from Headquarters USAF for execution by AMC.

With USAF policy pending toward a new research center to place Wright Field engineering laboratories in an alternate secondary position, and with trend to transfer maintenance of MATS and troop carrier command troops to civilian maintenance contractors from AMC depots (Aviation Week, July 14) the AMC headquarters at Dayton is rapidly being de-emphasized in the total USAF program.

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A Look at Lobbyists

Congress is set to turn the spotlight on the activities of Washington representatives. A resolution calling up a new member speed committee to investigate congressional lobbying has been approved by the House Rules Committee.

The committee is expected to start functioning in soon as the autumn session opens, looking off with a scrutiny of the regulations under the 1946 lobby act which include over a score of aviation representatives. The current investigation of "five percent" by the Senate Committee on Expenditures in Executive Departments is expected to result in legislation requiring representatives dealing with government agencies to register, as required of those dealing with Congress. Sen. Homer Ferguson (R., Mich.), has already introduced a bill to accomplish this.

Noise Problem

Public air agencies were created by law flying places has again risen to a point where the serious airplane vibration represents a corrective action isn't taken.

The New York area is a particularly sore spot, and investigations show that the public movement is parked in a number of cases.

Some airline pilots have not followed traffic patterns established at LaGuardia, Idlewild and Newark Airports. GAA has on file over 200 alleged airline violations of traffic patterns in the New York metropolitan area and very little action in the future against individual pilots.

Newspapers in New York City, Northern New Jersey and Long Island have recently editorialized against the airplane noise sources. The articles note that if adequate means were taken, municipalities and state governments can pass ordinances to prohibit flight over certain areas at any altitude—even though such action has doubtful legality.

Local aviation representatives have been advised to start an active public relations program to meet with city groups and municipal officials complaining against the noise problem and attempt to explain the difficulties involved. The aviation representatives would serve the local groups that the carriers are actively at work to eliminate in much noise as possible through flight patterns that are consistent with safety.

Meanwhile, appraisal of engineering progress made since World War II toward reduction of noise emanating from large transport aircraft as flight shows that virtually all noise reduction engineering has been directed toward passenger comfort inside the plane, with little or no attention to quieting the outside noise from the plane.

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The Truscon Straight Slide Doors employ a truss drive in the head rail, with interconnecting cables between leaves. All controls are within the buildings in case of power failure the doors can be operated manually with ease.

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Truscon "Terroboard" Steeldeck permitted the quick, economical installation of roofing on the immense buildings. "Terroboard" Steeldeck consists of a parallel system of strong structural interlocking steel members, which present a tenuous surface over which can be applied building roofing of any type, with or without insulation.

Truscon Concrete Reinforcing Bars were used in concrete slabs, columns, walls, footings, etc.



Truscon Architectural Projected Steel Window



Truscon Terroboard Steeldeck



Truscon Concrete Reinforcing Bars

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WHO'S WHERE

Douglas Aircraft Co. has advanced L. E. Tuller, vice president in charge of sales, to president, according to C. McMillen, 28 years at the company, who has reached retirement.

Chief engineer of Jack & Henry Products Industries' motor division is Donald E. Fritz, formerly chief project engineer. R. B. LaMotte has been named chief engineer for General Motors Corp.'s Aero-propulsion division. Assistant chief engineer since March, 1947, he became acting chief engineer last January.

Dr. Luigi Corbelli, jet propulsion and its previous administrative authority, has been appointed to the Princeton University faculty as Goddard professor, directing research at the Daniel and Florence Guggenheim Jet Propulsion Center at Princeton.

Charles Eichel-Toren is superintendent of air regulations in the civil aviation division, Canadian Department of Transport, Ottawa. He previously held Canadian duties in the Air Navigation Commission at RMO.

Allen A. Borne has been appointed manager of operations at Los Angeles Airport. He previously occupied San Francisco Air Lines' operations in the Western Islands. At TEMCO, H. O. Erickson has been named chief engineer. L. A. Child, Jr., becomes assistant chief engineer.

Ray, Guy E. H. Schuman (EMAC, Tex.) has joined Minneapolis-Hartwell Register Co. as assistant director of the screwthread division. Recent assignment with the Navy Dept. included metal and guided missile development. He retired from service last Aug. 1.

Stanley Washburn, Jr., has been named production director of Fox American Aircraft Co. He formerly held a similar post with American Airlines. J. P. A. has appointed William H. B. O'Brien assistant traffic manager in Tulsa.

Northwest Airlines has transferred J. J. Talbot, formerly traffic manager Philippines, to its eastern regional office at New York. He will work on development of cargo and passenger business in the Orient.

James Mitchell replaces Harry E. Kent, resigned, as Western Air Lines director at Memphis. Mitchell was manager of traffic and sales control.

Northwest Airlines has appointed Walter Stensland as vice president and director Sept. 1. He was a assistant v. p. of American Airlines and formerly was general traffic manager at Eastern Air Lines. Herbert C. Dobbis has resigned at NAL traffic v. p. and director.

OTHER CHANGES

S. H. Folsom, since 1941 manager of Koppers Co.'s Aircraft Division, has been named to the sales manager of the metal products division. Charles W. Perdue, formerly Koppers Co. manager, is named as president of ACE-Bell Metals Co. Memphis recently is constituted. J. W. Walker, former executive v. p. of Polytechnic Air Lines, is named general manager of Allied Van Lines.

INDUSTRY OBSERVER

U.S. Air Force has not yet installed its final 1910 aircraft passenger meet plans. Planned based has been meeting in the Pentagon. Variety of plans have been drawn to fit the varying amounts of money that may be turned by the current Congress. Final plans probably won't be drawn until after the final 1950 military appropriations bill is signed by the President.

Watch for more shifts in the USAF trainee passenger program. Pan-Am which has a letter of intent for 100 B-36 bombers does not yet have a firm contract and may not get one. North American is now back in the picture with a "1910 version" of its old standby the A1-E and B-36 may still get a slice of the USAF pie with an A-1-E-Motor trainee TEMCO trainee has been designated the T-33 by the USAF but it is not expected to figure in the passenger shifts.

Continental is now negotiating with the USAF on a contract to cover production of an additional 70 B-36 bombers. The new contract will be for the B-36D and conversion of the B-36A and B-36B models to include the new General Electric J-47 turbojets used in the B-36D.

Refines third turboprop aircraft, the McDonnell Douglas turboprop built by Hamilton Page, has completed its first successful test flight. The turboprop powered by piston engines has been ordered by British European Airways at a modification of 10 22 passenger capacity. The turboprop version has a cruising speed of 260 mph over a 3900-mph range with 5740 ft. payload.

Boeing has received a \$1,099,664 contract from USAF for ten B-25 ten bomb bins and six B-25 ten bombs designed for ground handling at the largest jet aircraft bombs now available. Initial deliveries are scheduled next July with the contract expected to be completed by mid December.

An Airlines of India has taken delivery of a French SO-95 five engine 12-passenger bomber liner for test purposes on its airworthiness test loads bearing out from Toulouse. The airline now operates 13 Douglas DC-3s and three De Havilland Rapides and carries about 4900 passengers monthly.

Canadian Car and Foundry Co. of Montreal is now working on a new 18-ton payload version of the Renault flying transport. Concepts is buying to rebuild USAF and RCAP in a troop and cargo carrying version of the big flying wing.

TEMCO, Evans Engineering & Mfg. Co., has two new subcontracts from Boeing-Walton Division and General Electric. One is for building and fabrication of beam channels on the Boeing B-47. The other contract calls for castings and forgings on the B-36.

McDonnell Douglas has applied for patents on two Navy jet fighter squadrons based at Cecil Field, Jacksonville, Fla. The field has become one of the Navy's principal Atlantic Coast air bases building up from 21 runways to over 2000 acres and 108 planes during the last nine months.

Watch for new airline interest in the converted landing gear as a result of CAA approval of 48 mph converted component for the Douglas DC-3 transport if equipped with Goodyear retracting wheels for converted landings. Recent tests made by a CAA DC-3 on the West Coast and a Goodyear DC-3 at Lockheed, Tex., under CAA supervision, are being for the making a larger DC-3 with converted gear would have a small flight efficiency drawback to much more than the other two engine transports.

First three Percival "Proton" transport planes assembled at the Indian government's Hindustan Aircraft Ltd. factory in Bangalore made their official test flights recently. HAL is to assemble 12 more from parts supplied by Percival Aircraft Ltd., London. The planes are being over to manufacturers of the two-engine 1500-lb. craft. On the plant's plans is an order for 50 for the HAL.

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RIGHT PAIR: Air Force's B-35 looks like the B-36, but its design is stressed as a late and separate chapter of the B-36 story.

Why B-36 Was Made USAF Top Bomber

House investigators hear colorful history of plane since original contract in 1941.

By Robert Sikta

Conair's B-36, intercontinental bomber is the last all-purpose bomber now in production or available for production in the immediate future, according to USAF experts.

This evaluation is based on aerial flight performance comparisons of the B-36, the Boeing B-50 and B-54 and the Northrop B-49 and was presented to the House Armed Services Committee by Maj. Gen. Frederic H. Smith, Jr., USAF, deputy program director. Gen. Smith testified at the opening session of the House committee's investigation of USAF B-36 procurement policies and the role of armor in the national defense structure.

According to Smith's testimony the USAF verdict in favor of the B-36 was based on the following findings:

- B-36 proved to be faster than the B-50 over the B-50's maximum range. In addition to the greater range offered by the B-36 it had a marked altitude advantage over the B-50.
- B-36B performance was demonstrated superior to the Boeing B-54 in every respect except speed over the target.

The B-36B using jet boost is expected to be even faster than the B-54 over the target area.

• B-36A performance showed it to be superior to the Northrop B-49 as a strategic reconnaissance plane due to its range and stability. Gen. Smith said USAF experience indicated the B-49 had limitations to pitch and yaw making it unstable as a bombing platform and requiring an auto pilot more accurate than those now available. The B-49 had other shortcomings including lack of suitable emergency positions and lack of anti-availability for positions, he testified.

Final decision to continue with the B-36 program was made in Washington on June 25, 1945, by a joint committee of Air Force Secretary Benjamin B. Row, Gen. William D. Eckhart, representative Undersecretary of the Air Force Arthur S. Rowan, Gen. Mark S. Fitchfield (USAF) vice-chief of staff, Maj. Gen. K. C. Wolfe, of the Air Materiel Command, Gen. Lauris Norstad, deputy chief of staff for operations, Maj. Gen. Donald Pitt, USAF, deputy chief of AMC engineering division, Maj. Gen. Cressdon Gardner,

chief of USAF aircraft requirements, and Gen. George Kenney, commander of the Strategic Air Command. At this decision meeting Kenney and Norstad, around their previous strong votes against the program.

• Kenney's View—Gen. Kenney was the strongest and most persistent opponent of the B-36 during its post war career according to Smith's testimony. Kenney originally favored the B-50 in the troubled 1945 heavy bomber with the Boeing project B-47 as its eventual replacement. Kenney believed the development of built-in range for intercontinental bombers was technically impractical and that strategic bombing operations would always require the use of advanced bases within striking range of enemy targets or aerial refueling.

An late in January, 1948, Kenney's view as the technical unsoundness of developing intercontinental bombers prevailed in the USAF top levels. At this time development on the Boeing B-52 then contemplated as a 90,000-lb. bomber was dropped and plans were made to modify B-36's coming off General's 12. Worth production line as to make for serial refueling of B-36 and B-54 bombers. Kenney believed B-36's better-e more would be only 4,500 miles. Practical factors in choosing the B-36 rather between B-36 and B-54, were 1948 according to Gen. Smith, were:

• Development of the envelope core as a new criterion of measuring bomber performance. This criterion placed primary emphasis on speed over maneuvering and speed at various altitudes instead of the top speed, top altitude, and maximum range characteristics formerly used. Heretofore, the envelope core presented a more realistic picture as an overall performance.

• Extensive trimming of the B-36 flight test program. Both the B-36A and B-36B in their early flight tests indicated that the anticipated time in the B-36 performance could be obtained and that eventual performance improvements would result, factors then previously anticipated. In addition, production progress at Ft. Worth depicted earlier doubts as to feasibility of large scale production of the B-36.

• Intensification of the international situation that eventually resulted in the Russian blockade of Berlin in June, 1948. The requirement for a force of intercontinental bombers is being raised for immediate action because more stress in Russia's foreign policy became apparent. This indicated the air staff to concentrate on production of available models rather than bank on research progress that might produce superior planes in the future.

Other highlights of Gen. Spaatz's testimony were:

• **Convair-Northrop merger** was originally proposed by Floyd B. Olson at a working meeting. Air Secretary W. Stuart Symington, John A. McCone, members of the President's Air Policy Commission and a special adviser to the Defense Secretary Forrestal, Dillman, and John Northrop at McCone's Los Angeles home, July 16, 1943.

USAF made no objection to the merger but John Northrop objected strongly. USAF had already indicated that it planned to produce the Northrop B-49 at the government-owned plant operated by Convair at Ft. Worth after completion of the B-36 program. Eventually a few amendments were worked out between Northrop and Convair on the B-49 program to enable USAF to combine the Ft. Worth production facilities with Northrop's engineering staff on flying wing types. Later the Ft. Worth B-36 program was cancelled clearing production facilities for other B-36s.

• **Flying Wing production program** called for three strategic reconnaissance versions of the B-49 powered wing. The first version for which a production order of 30 was given out in fiscal 1949 USAF funds was to be powered by eight Allison J35 turbojets. Range at that time was not sufficient to meet USAF strategic reconnaissance requirement.

Second version using more powerful

B-36 Time Table

April, 1943—20,000-mph range, 20,000-lb bomb load requirements set for very long-range reconnaissance bomber.

Oct. 19, 1943—Convair wins design competition over Boeing and Douglas and gets contract for B-36A.

June 18, 1944—Gen. H. H. Arnold, chief of Army Air Force directs purchase order of 120 B-36 bombers.

July 31, 1944—Convair signs letter of intent to build 160 B-36.

July 15, 1944—Convair directed to start up B-32 production program at expense of B-36 program.

Aug. 15, 1944—Secretary of War approved loan procurement contract for 120 B-36s to replace single-engine bombers.

Aug. 9, 1944—Air Staff conference on post-war Air Force requirements first groups of B-36 models sent home in just one 72-page Air Force and operations instructions publication.

Aug. 8, 1944—First flight of B-36 at Ft. Worth.

Dec. 12, 1944—First postwar evaluation of B-36 program at Gen. George Kenney's request. Kenney's suggestion for a contract rejected by Air Materiel Command and General Hapgood.

March, 1945—Proposed by Convair for the B-36M using a Pratt & Whitney V4D power plant (later installation failed) increasing top speed to 410 mph, service ceiling to 47,000 ft.

Aug. 16, 1945—B-36 reaches altitude of 30,000 ft.

Aug. 15, 1945—U. S. Air Force Arsenal and Weapons Board evaluates B-36 program and decides to continue production program of 200 B-36s with Boeing B-52 designated as eventual B-36 replacement.

Aug. 26, 1947—B-36A test production could three in Wright field for static tests.

Sept. 4, 1947—B-36C program suggested to Air Staff by converting last 34 of 100-plane program in V4D tractor version. Estimated costs of B-36C program to be met by cutting tail program back from 130 to 93 planes.

Oct. 18, 1947—USAF Arsenal and Weapons Board approves B-36C program with Gen. Kenney making such dissent. Kenney says B-36 are at actual tests, reconnaissance and anti-submarine air search.

Dec. 4, 1947—YB-36 makes first flight.

Dec. 5, 1947—USAF approves B-36C program.

Dec. 14, 1947—YB-36 plane 49,900 ft altitude on third flight.

April 8-9, 1948—First long range B-36A flight—12 hr., 6012 mi., 20,000 lb bombs dropped halfway, two engines and during most of flight.

April 26, 1948—Air Staff recommends cancellation of V4D program due to existing problems in engine above 40,000 ft and outbreak of B-36 program to 41 planes.

Sept. 1, 1948—Reports General completed investigation of B-36 program.

Mar. 23-24, 1948—152 miles 36 hr. flight of B-36C on work test engine out of order. Carried 10,000 lb bombs.

Mar. 21, 1948—Cancellation of top USAF efforts at Mr. Symington's effect declines to continue B-36 production program at least through 61 planes but covers B-36C V4D program.

June 19, 1948—Air Staff decides to continue full B-36 production program.

June 30, 1948—B-36A drops 72,000-lb bomb load.

June 28, 1948—B-36A drops 104,000-lb bomb load over 41,000-ft bomb from 71,000 ft, and another from 69,000 ft.

July 18, 1948, 1947—B-36A first 6012 mi. non-stop transcontinental B-36 night averaging 753 mph—done then B-36 average speed.

Aug. 21, 1948—B-36A reaches 47,750 ft.

Oct. 26, 1948—YB-36 reaches 41,710 ft altitude.

Nov. 1948—USAF Reconnaisance Committee recommends B-36 over B-49 for long range reconnaissance plane.

Dec. 5, 1948—B-36B flies 8275 mi. on short 40,000 ft at average speed of 593 mph.

Dec. 7, 1948—B-36B flies 5250 mi. on short flight Ft. Worth Texas mission dropping 12,000 lb bombs at 40,000 ft.

Dec. 9, 1948—YB-36 reaches altitude of 45,180 ft.

Dec. 12, 1948—B-36B flies 4900 mi. on short 40,000 ft averaging 513 mph.

June 14, 1949—B-36B production authorized with line jet engine drop at order wing prod facilities in addition to six J4W J4100-1 engines.

disputed management) changes to speed up production of the B-36. USAF also found evidence that engine tests had been used by Convair production personnel on the XB-36. Strong action was taken to tighten what USAF termed a "leaky inspection system" to both USAF and Ft. Worth field office and Convair's best management. After Lt. Major T. C. Coker, succeeded Billy Woodhead as president of Convair's management shift was made at Ft. Worth.

• **Complete failure** of the attempt to make the Pratt & Whitney V4D power plant based on the M4350 piston engine for the B-36 airborne. This version designated the B-36C would have used tractor propellers instead of the piston new used. It was originally expected to boost performance to 410 mph, top speed and 47,000 ft altitude but unsolvable cooling problems prevented those 40,000 ft, at altitude change has been forced perfect cancellation.

• **Sharp conflict** between Strategic Air Command and Air Materiel Command over continuing the B-36 program. Gen. George Kenney, then SAC, commander, maintained a consistently low opinion of the B-36 prospects while Lt. Gen. Nathan Twining, then ANWC commander, urged Kenney to string along with the B-36 since in its early stages it had fewer bugs than either the Boeing B-37 or B-39 at comparable stages in development. USAF chief of staff Carl Spaatz supported Twining's position.

• **Development of the B-49D**, using four jet engines in addition to the six J4W B-4160-1 piston engines was aimed primarily at increasing speed over the target area as a defense measure.

• **Lovett-Turbin-Shippening** Convair-Birth contract broken of B-36 deal opened was testimony, by Robert Lovett assistant secretary of war for 1941-45. Lovett testified the B-36 was a design competition in August 1941 to meet an Army Air Force requirement for an intercontinental bomber capable of carrying 10,000 lb of bombs on a 16,000 mi. mission. Maj. William Ford was president and principal stockholder of Consolidated Aircraft Corp. at the time the B-36 won the competition over Douglas and Boeing designs. Northrop was also asked to submit a flying wing design in the competition but no further action was taken as the Northrop proposal at that time.

Lovett testified at the time Gen. Spaatz was the B-36 competition he had had heard of Flying Wings as Victor Emmanuel and as far as he knew there was no political or financial consideration in award of the contract.

Initial production contract for 100 B-36s was awarded on post given first for bids in June of 1941 when the Twining conference in Washington indicated that there was little hope of conducting strategic bombing of Japan



Raider Makes Debut

First photos of actual production model Northrop B-35 Raider three-engine monoplane for USAF have been taken at Hawthorne, Calif., on beginning of accelerated test program, and also place up large-scale details of the B-35. The new large-scale details of the B-35 are being made by Lockheed and also place up large-scale details of the B-35. The new large-scale details of the B-35 are being made by Lockheed and also place up large-scale details of the B-35.

The long nose housing three radars extends up to 41 ft high, 9 ft wide, and 24 ft long. Military personnel are seated in the nose. Modified tail features eight radars. A total of 23 Raiders are on order—11 as search transports which will act in lieu of glider in establishing altitudes, and 12 to be assigned for Arctic rescue missions. Northrop has licensed Canadair, Ltd., of Montreal, to manufacture the Raiders for the international market. The model's wing design and ability to operate from short, unimproved flight strips is said to have received interest in the plane by both the Army and Navy. Initial delivery schedule provides for six minimums, including a winged landing strip, giving only some to control fields.



from Chicago to San Antonio B-17 or B-29 range.

On the assumption the equipment for the very long stage bomber again became scarce in plans for strategic bombing of Japan. After capture of the Mariana Island bases brought the B-29 within range of Japan. AAF ordered Convair to shift priority from the B-36 to the B-12, a bomber roughly equivalent to the B-29.

► **Keels for Acheson-Lovett** said that although he had no detailed knowledge of the post-war B-35 program he was fairly convinced of the need of having a force of uncommitted bombers ready for instant action and instead spent time to fight a war with the airplane itself on the drawing boards instead of time on the production line.

Gen Smith said the first part was evaluation of the B-35 program or effort not after V-E Day at which time the A-1 Staff recommended a force of five B-35 bomber groups in a mobile task force in the 76 group post war. Air Force capable of immediate operations from North America bases against any potential enemy.

Inspectors Wanted

An examination by PAA personnel inspectors has been authorized by the Bureau of the U. S. Civil Service Commission, Wright Field.

Personnel inspection was wanted for aircraft, engine, instruments, engine materials and component, tooling, propellers, tools and jigs, safe and storage equipment, tools and jigs, tools, and materials and processes.

Application forms may be obtained from first and second-class post office, mail room, regional office at U. S. Civil Service Commission, Washington, D. C. Application must be filed by June Aug. 10.



Artist sketch showing how the Boeing-developed flying boom could refueling system works. The tanker aircraft (B-29) hooks onto the bomber (B-29) by means

PAA Merger Aims Held 'Fantasy'

Public counsel declares PAA has renewed 'chosen instrument' ambitions, plans to drive TWA out.

Blatting criticism of Pan American Airways' proposed purchase of American Overseas Airlines—and a strong reiteration that the deal has disappeared—was made by Civil Aeronautics Board public counsel.

"The steps are taken in this case on the name of 'merger,'" Public Counsel of James L. Highgate, Jr., and William F. Kennedy, declared. Acquisition of OAA would not in itself make Pan American a chosen instrument under Civil Code, but the second principle it would be a long and probably fatal step in that direction.

► **Criticisms Revisited**—If Pan American's purchase of OAA (for about \$15 million in PAA stock) is approved, the CAB attorney's conclusion, the public interest requires other important changes in North Atlantic certificates. These measures, proposed by public counsel, derive from the long-standing rule that PAA's primary North Atlantic operating rights frequently would never be curtailed should the world tank, and would give TWA additional overseas traffic points in that a "competitive balance" can be maintained.

PAA president Juan Trippe already has stated that his company could not "under any circumstances" accept the conditions which public counsel wants to attach to the merger. Trippe said the conditions would leave the effect of changing "both legs and one size of the shoe" and leaving them to TWA.

► **PAA Objections**—Highgate and Kennedy declared that whatever may have been the intention of C. R. Smith and

American Airlines' board of directors in selling OAA, the board is clear that neither in Pan American and Juan Trippe are concerned the deal "to merely replace of a skeleton due to establish a private control controlling a strategic sector of our national life."

The attorney and the question to be decided is whether the President and CAB should reverse the policy of competition between American flag operators which is embodied in Civil Code, and which Congress, in spite of repeated warnings, has refused to modify.

► **Criticisms Revisited**—North Atlantic certificate is still in the U. S. economic and political interest, public counsel emphasized. "The logic of control of all American flag operations over those routes in the hands of Pan American and Juan Trippe is to place U. S. policy and interests in the hands of a company which is individual who in the past placed their private interests above the declared policy of their government."

In an effort to prove that Pan American has acted contrary to U. S. policy, public counsel cited letters from PAA officer purporting to show that shortly after Pearl Harbor the company initiated requests for more schedules in Latin America because it feared with a new world would decrease existence of new equipment "which might be taken away from us to meet greater emergency elsewhere."

That at a time when the nation faced one of its greatest crises, PAA was withdrawing from the government full information on its resources of men and

equipment, the brief asserted. "How, in the face of this conduct can serious consideration be given to extending Pan American with such a substantial loss for American flag service to Frankfurt and Berlin, and to other such in Scandinavia which would be the first to feel the weight of a new airline expansion?"

► **Deliberate Steps**—To bring Pan American to have a monopoly of all American flag operations should be to create a dual monopoly, dealing at once with the U. S. government and driving the government, while it would compel subjects to do in public counsel charged.

"Acquisition of American Overseas by Pan American would create a substantial danger that PAA would be left in sole possession of the North Atlantic, within a fairly short period of time, because TWA (with 46 seats) financed entirely now be compelled to withdraw," the brief continued. "Once the OAA purchase is completed, PAA can be expected to combine its domestic and satellite companies to drive TWA out of the North Atlantic."

Public counsel stressed Pan American of conducting a long range strategic campaign to establish complete control of all American flag operations, its transportation in acquiring other strategically located routes and eliminating or reducing competition with other companies by dividing territory. It is to be expected in competitive operating, PAA allegedly anticipated the use of Pan American's government with respect to granting landing rights to American flag airlines, obtained exclusive franchises or landing rights, denied other nations the use of Pan American, and opposed and put competition for American flag airlines.

Plan Four-Engine Channel-Wing Plane

A newly drafted Perle College project to build a channel wing airplane with four engines of approximately \$500,000 for a four-engine aircraft design project developed by Wilbur B. Götter, Hagerstown inventor.

Götter told Aviation Week that it was decided to build the Perle project a four engine plane because of the additional safety factor in case of engine failure. The present flying test bed is proving an improved design of wing channel (Aviation Week, June 16, 1948) and his earlier channel wing craft (Aviation Week, Sept. 15, 1947) both were four engine craft. Problem of engineering performance on these aircraft has always been one of the first questions asked by spectators at demonstrations.

Wail, is expected to start this month



NEW C.W. PRESIDENT

Key E. Hawley, former director of aviation training engineering at Ford Motor Co., has been named president and a director of the Chance-Vought Corp. as management approach moves toward increased emphasis on production of transportation products. He is joining Ford. Hawley was not previously manufacturing for Boeing Aviation Corp.

at the Earl S. Long, Ill., aviation school on the new craft. Hawley will be chief engineering consultant on the project.

Both Chance and Dean Nels C. Beck, of the Fiske College of Aeronautical Technology, who accepted the contract for the project, expect that the four-engine craft will be able to take off from a standard field with "little or no roll," and to hover in mid-air for as long as 10 minutes. The design is expected to be of the channel wing type, or through the channel that coming left over the channel section.

Oliver L. Parle, founder of the school, says a part of St. Louis University has been a proponent of similar four engine aircraft because of three safety factors for new uses and sought to get such a plane to use as his faculty began immediately after World War II. Tripartite was won by the winner of the wartime Parle bomber plane with Mid Continent Airlines.

Götter said the Perle-built channel wing plane would be a completely new "designed to be a 'channel wing' airplane and not a 'channel wing' version like the two earlier craft.

AF, Boeing Study Production Future

Air Force and Boeing-Aircraft Co. are studying what will happen to the 25,000 employees in the Seattle area when production drops. So Air Secretary W. Stewart Symington and other

top Air Force officials will fly to Seattle later this month to discuss that problem with Boeing, which recently announced it was planning a "substantial" decline in Seattle plant employment.

Boeing's terrific losses from the cancellation earlier this year of the B-54 contract which would have added 10,000 jobs, the principal production of the Seattle civilian contract was in 1948, and William M. Allen, company president.

► **Tapering Off**—The Seattle and Renton plants now employ about 25,000 persons. No reduction has been given as to how much this figure will shrink, although it is known Boeing has declined it cannot operate efficiently with a work force of less than 10,000.

Seattle Union Air Force personnel on leave of absence to construct the major production in Wichita, Kan., where the B-47 already is produced.

Boeing, in its financial report for the first half of 1948, stated a profit of \$1,445,000 against a loss of \$1,049,000 in 1947. In 1947, Boeing's production—Total Statewide—was in place at \$15.4 million of which \$13.1 million has now been written off.

The first six months of this year saw the reduction of 1,000 jobs with 345 on order, and 15,500 persons, with 42 still on order. Sales amounted to \$10,823,155. Bookings are listed at \$76,024,201.

Chase to Move?

On the chance of the New Jersey State government rapidly growing Chance Aircraft Co. is being strongly urged by the Connecticut State government to move its headquarters at Trumbull and move into the multi-million dollar plant recently completed by Chance-Vought Aircraft at Stratford Conn.

Chance executives already have met with Connecticut's governor Chauncey B. Ross, Senator Allen McMillen, and other officials to discuss the offer.

More than 100 Chance employees are anxious to leave Chance from New Jersey to start a new plant in Stratford. It is believed that the move to Stratford would help alleviate a major unemployment problem in that area. An estimated 19,000 persons are out of work, partly because of the Chance move. In Stratford, Conn., the Chance plant is now in production, but the 19,000 persons are in the process.

Chance says it has made no decision on the proposed move, but a spokesman stated that the company does not mind going.

Employment has about doubled in less than a year and now is more than 3800. This figure is expected to increase greatly when production is started on the 67 troop-carrying YC-119 assault transport (Aviation Week, Jan. 17).

FINANCIAL

Air Shares Up Value of Trust Folios

Large investment trusts are improving their aviation holdings because of favorable rises in these issues.

Aviation shares are restoring an increasing interest whenever held in revenue asset trust portfolios. This is indicated in a preliminary examination of mid-year reports now being released. It is highly significant that rising market prices for many aviation issues mean June 30, 1949, have registered even greater values than that shown at the second date.

National Aviation Corp. involves the largest investment trust devoted exclusively to aviation commitments, making its periodic shifts of portfolio interest.

Aviation Club—As of June 30, 1949, net assets were valued at \$6,641,872 or \$14.88 per share. This represents a reversal of a declining trend in net asset values which had been in process since Dec. 31, 1948, but that trend, with no allowance for \$2.25 in dividends paid during 1948, net assets aggregated \$94.41 per share. The first point was reached at Dec. 31, 1948, when the per share valuation stood at \$14.78.

During the last six months of 1949, National Aviation's net equity income amounted to \$12,176 as compared with only \$97,410 for the same period in 1948. However, based on the sale of securities during the current period aggregated \$61,930 and was an improvement over the \$116,442 loss in the same period for the first six months of 1948.

It is noteworthy that little change in the overall composition of the trust's industry participation was effected from Dec. 31, 1948 to June 30, 1949. As of the latter date, aircraft and aerospace constituted 75.3 percent of the total portfolio values, compared for 84.3 percent and civil U. S. aircraft amounted to 34.2 percent.

During the first six months of this year, National Aviation liquidated 4800 shares of Boeing. A total of 2000 shares of Thompson Products were also sold. Curtiss-Wright "A" investments were reduced by 393 shares. Also, 900 shares of United Aircraft preferred was disposed of.

Offsetting these sales were a sale of purchases in the aircraft group. Such acquisitions included an additional 7100 shares of Curtiss-Wright common, 900 Douglas, 3000 Lockheed, 1700 United Aircraft common and 200 Great Western preferred.

Airline to Industry—The trust was also active in the airline group and allocated a number of significant transfers. A total of 9300 shares of Northwest Airlines preferred were liquidated, cutting the previous commitment of 10,000 shares in half. It appears that this transaction is accounted for the bulk of the trust's loss on sale of securities for the current six months. The company's former holdings of 12,000 shares of Pan American Airways were completely disposed of, mostly during the second quarter of this year.

The proceeds from these sales were applied toward the purchase of an additional 10,000 shares of American Airlines common, bringing total holdings in the issue up to 20,000. Another 400 shares of AA preferred were also purchased making a total commitment of 11,300 shares in this airline equity.

Going effect total of the above transfers, National Aviation's June 30, 1949, portfolio comprised the following: Aircrafts 21,000 Bell, 5000 Douglas, 5200 Boeing, 17,300 Curtiss-Wright common, 1800 Curtiss-Wright "A", 8800 Douglas, 1000 Great Hydroplanics preferred, 20,000 American, 15,000 Lockheed, 25,300 North American, 7000 Sperry, 9000 Thompson Products, 47,700 United Aircraft common and 1300 United Aircraft preferred.

Aircraft 18,800 Air Export International Agency common, 20,000 American Airlines common, 13,300 American Airlines preferred, 15,900 Boeing, 5800 Chicago & Southern VTC, 14,000 Delta, 49,200 Eastern, 10,000 Northwest preferred and 1000 United preferred.

Total indicated cost of the portfolio of National Aviation amounted to \$6,074,641. Market values at June 30, 1949, however, were only \$5,918,130. The largest individual holding was in American Airlines preferred with a June 30, 1949, market valuation of \$784,728 against a cost of \$946,668. The second largest commitment is in the same date was represented by 49,200 shares of Eastern with a market valuation of \$551,600 against a cost of \$449,900.

Concerning the Field-Specialized five issue trusts are also present as individual funds under a broad group of investment companies sponsored by professional managers. One such large fund

comprises the aviation shares of Group Securities, Inc. This fund's net assets aggregated \$2,325,935 as of May 31, 1949. A year earlier, assets were considerably higher at \$3,960,791. It appears that this group attempts to diversify very broadly without any serious effort to carefully discriminate among issues for special factors. In this respect, it may be assumed that a broad representation in the industry is obtained.

Group Securities aviation fund as of May 31, 1949, consisted of the following portfolio: 17,900 American Airlines common, 6500 Boeing, 2500 Bell, 4500 Boeing, 11,000 Braniff, 4800 Cessna, 10,000 Consolidated Values, 7000 Curtiss-Wright "A", 2300 Douglas, 3500 Eastern, 200 Fairchild Camera, 15,000 Fairchild Fine and Appleton, 8000 General, 10,000 Lockheed, 9000 National Airlines, 15,000 North American Airways, 10,000 Northwest Airlines, 15,000 Pan American Airways, 20,000 Piper, 16,500 Republic, 6000 Sperry, 7000 United Aircraft and 9000 United Airlines. This group made important additions in its holdings of Boeing, Northwest Airlines, Curtiss-Wright "A", Braniff, Fairchild Engine, Eastern, and General. Reinforcements were made in investments in Bell, Boeing, Douglas, Fairchild Camera, Lockheed, and National Airlines.

Among the general type investment trusts that does not appear as yet, any appreciable interest in aviation shares.

American and Eastern appear to rank among the favorite airline holdings of general investment trusts making an important commitment. There is no such clear preference among the aircraft holdings.

Diversified View—It is apparent that frequently conflicting views prevail among investment trust managers. For example, while one fund may sell off blocks of an airline security, another trust may be buying the same issue.

To many supporters of the aviation industry, it is disappointing that general investment trusts, which have the maximum resources of capital, have not seen fit to make increasing commitments in airline and aircraft shares. If any widespread trend is in this direction even that place, the aviation groups may have come to a major source of capital which could finance needed growth and expansion.

All too frequently, however, investment trusts, particularly those which have previously been hurt by past mismanagement, resist the elimination of assets of the risks to new investments before making a new investment. Such delay, while it assumes insurance against any loss the preference as opportunity for substantial profit.

—Selig Altschul

Parker Precision Adds Power to Jets

Take a jet engine down and you'll find many parts made by PARKER. These parts are precision-machined, accurate to the minutest detail, to fit perfectly into the intricate, "clock-like", "jewel-like" mechanism of jet engines. Nine of them are spotlighted at the left.

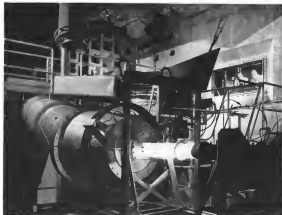
Manufacturers are turning to PARKER more and more frequently for vital new parts such as special valves and related components for aircraft fuel and hydraulic systems. The reason is to be found in the skills and know-how of PARKER craftsmen... skills and know-how that are so necessary to produce work of the extreme accuracy and tolerances demanded by jet engines. They are skills and know-how that perhaps can solve a troublesome problem for you.

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LOOKOUT FOR A BLOW OUT...

► These research engines are now the "lookout" for a better blow-out as they test a new jet combustion chamber under development at Wright Aeronautical Laboratories.

► It's a precision test—the test rig simulates conditions that a modern engine must encounter in a jet operating at supersonic speed.

► Research like this advances the efficiency of the ram jet. It guides the engineer to the best combustion chamber design for eliminating flame blow out and bringing maximum combustion and operating stability to ram jets... the flying forefront of modern aviation.

► To simulate high speed operation up to 2800 mph at altitudes up to 60,000 feet, air is forced up by huge blowers heated to 600°F to duplicate compression heat that results from ram. At this stage fuel is injected at high pressures and the fuel-air mixture ignited. The exhaust products are then vented at 4000 mph to simulate the exhaust flow pressures encountered at high altitudes.

► Ram jet combustion research is one of many ways in which Wright Aeronautical is conducting the development of future type power plants to make Wright aircraft engines—great today—even greater tomorrow.



POWER FOR AIR PROGRESS

WRIGHT

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GENERAL ELECTRIC

AERONAUTICAL ENGINEERING



VIEW FROM COCKPIT: 50 ft. shows large British Brabazon's wing shown coupled and heated engines. Each geared unit affords 5000 hp.

How Engines Are Coupled On Brabazon

Twin Centaurus power unit passes type test. Vibration is overcome.

Another significant phase has just been completed in the long series of preparations for testing Britain's large British Brabazon (Aviation Week, June 27, 1949) for a patrol fight trials.

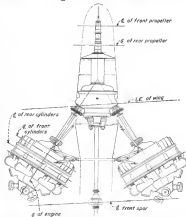
The twin Bristol Centaurus power unit, specially developed for the plane has successfully completed the first Air Registration Board type test ever accomplished for an aircraft engine installation of this nature.

This means that the Brabazon's eight engines, arranged in four pairs and developing over 20,000 hp., have been officially approved for use as a civil aircraft power unit before the prototype's flying trials are due to begin.

► **Vibration Overcome**—Development of the Centaurus installation has involved as much research and engineering as a completely new engine. The type test, climax of over 1200 hr. of development running began in February, 1946 when the unit ran for the first time. It was not set on a mockup of a 21 ft. wide section of the Brabazon's wing to simulate flexibility and influence of aircraft structural conditions.

The unit ran the normal 150 hr. run, consuming 50 lb. of maximum continuous power (dub), 10 at idling power, 30 at maximum with mixture power and 40 hr. at various cruising powers.

Results are significant because reports indicate that the problem of vibration—a troublesome factor in earlier coupled



PLAN OF HOOKUP for Brabazon's Bristol twin Centaurus power unit showing duct connections to reflector gas. Taped mounts are used instead of conventional ring installations.

19

trucked hexagonal insert



tough one-piece cold-chamber cast



Tufflok Nut

New Townsend Tufflok Nut Is Tougher Three Ways To Give You Tighter Grip, Greater Safety, With Economy

You get a tighter grip on the bolt by and economy with the new Townsend Tufflok Nut. It gives you more surface of friction. The textured Tufflok Design gives the materials in the nut's and bolt body contact to give you the toughest lock nut yet produced. It gives you more safety since they just under a variety of adverse conditions. Here are the New Features Features of the Townsend Tufflok Nut:

1. Tougher grip—can't turn it off as well, gives you surface grip on the bolt of all sizes. Specially threaded insert, gives more lock, and lock depend on. Special inserts when special applications are required.
2. Tough, one-piece cold-chamber cast hexagonal design to prevent cracking and twisting.
3. Tough threads cut to cold-chamber cast are stronger, give no stress, more pulling, spend no replacement and also afford more strength.

THE TOUGHEST LOCK NUT EVER PRODUCED

1. Townsend Tufflok Corporation produces Tufflok in a trademark of the Townsend Corporation.

The quality, safety, and safety with economy, you get in the new Townsend Tufflok Nut is made possible by the skill and experience of the Townsend Corporation in the cold-chamber cast. The Townsend Corporation is a manufacturer of steel and stainless steel fasteners in the United States. They have been working with the Townsend Tufflok Corporation in producing a variety of lock nuts and give you the advantage of a reliable source for your lock nut requirements.

This new Townsend Tufflok Nut is an improved design, made in the Townsend Corporation's cold-chamber cast, and is available in sizes 1/4" through 3/4" and 1/2" through 1 1/2". It is made in the Townsend Corporation's cold-chamber cast, and is available in sizes 1/4" through 3/4" and 1/2" through 1 1/2". It is made in the Townsend Corporation's cold-chamber cast, and is available in sizes 1/4" through 3/4" and 1/2" through 1 1/2".

For longer service with greater safety and economy, specify Townsend Tufflok Nuts. Write today for samples and complete information.

Call or write today 301

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nutlet wheel both are brought into alignment with the peak, thus preventing reverse direction rotation.

In normal operation, an arrangement of springs in the past unit completely isolates each pump.

To provide reverse torque in the reverse direction is the case of an expected occurrence, such as a backfire, the nutlet wheel reversing incorporates a high torque bypass clutch.

► **Lubricating System**—Three independent oil systems are provided. These supply, respectively, the left-hand and right-hand engines and the dual induction gear, and each consists of an oil cooler and a service oil tank.

As to the oil cooler is ducted from the forward portion of each engine oil. The ducts run straight to the two oil coolers which discharge them to through variable area shutters into the main wing space. The induction gear cooler is partly fed by small ducts from both the main cooler ducts. This also discharges into the wing space. An outlet from the wing space is provided through the rear spar and upper wing skin, near the trailing edge.

Since the oil consumption of the gear box and propeller system is of a minor order, the capacity of the tank feeding these units is correspondingly small. The oil specified incorporates a special additive to suit high duty loading.

The engine oil tanks are also kept in the ambient fuselage area, thus ensuring satisfactory behavior under cold climate conditions. A constant level is maintained in these service tanks, made up of being supplied from a common permanent storage tank in the wing.

► **Fire Protection**—Complete fire detecting and extinguishing equipment is built into the powerplant. At critical points on each engine, and attached to the forward ends of the engine oil, are a series of flame detecting switches electrically connected to a fire warning indicator in the flight engineer's throne.

Should fire break out, he will be immediately advised, stop the engine, feather the prop, close the cooling air inlet and outlet shutters, turn off the fuel and oil, and put the fire extinguisher system into operation.

The anti-squawking system consists of a series of rings extending the forward and aft portions of the engine, through which aerodynamic is forced. In addition, methyl bromide is taken to the exhaust manifold and to the engine air exchangers, to ensure that combustion within the engine occurs satisfactorily.

To prevent any possibility of flames from an engine oil leak penetrating to the wing space behind the spar, shutters are provided at the entry to the oil cooler air ducts.

► **Accessories**—These are oper-

ated both electrically and hydraulically, and are maintained by pumps and solenoids driven by the main engines. They are grouped around the accessory gearbox, which, in turn, is securely bolted to the front of the wing space between the two spars. Lubrication of this gearbox is self-contained, a supply of moderate capacity and pump being provided.

Drive to the gearbox is by high speed shafts connecting with the accessory drive output shaft at the dual induction gear. This shaft is 20 in. long, connected by a short intermediate shaft carried in bearings in a housing secured to fixed members. At each end of both sections of the shaft are Revolve Lumb-type joints.



VIBRATION TEST: left is conventional mount, size on right has wire cushions

Wire Cushions Isolate Shock

Pads of molded steel threads prove more advantageous than rubber or springs for shock mounts.

Thousands of tiny stainless steel threads, knitted and molded under high pressure into cushions, have been found to supersede rubber as springs when installed in shock and vibration isolator systems.

Developed after three years of research by Robinson Avionics, Inc., these Mit-L-Flex cushions are now incorporated in Robinson's dual suspension Vibrocheck mounts. Orders already have been received from Bendix Aviation's Eclipse-Bonanza domain and Servotronics, Inc., for military contract work.

► **Advantages**—The new material, according to Robinson, has three advantages over rubber and springs.

► It is unaffected by spinning torque, here rubbers become so misaligned in all cases.

► High damping action is provided through intensive friction in such cushions, reducing unpleasantness of movement and offering greater structural stability in the mounting system.

► Draft, or permanent set rate, is negligible.

► It does not deteriorate in the presence of all solvents.

Vibrocheck mounting systems

equipped with Mit-L-Flex can be under-loaded or overloaded by as much as 15 percent and still correct vibration isolation specifications.

► **Almost Pinned-Up**—Mit-L-Flex almost doesn't happen. The company which manufactures the knitted metal fast finds it difficult to shock mount problems in the product. Robinson itself of first use to and use in the material. Robinson had been engaged in Vibrocheck cushion production during the war and found springs rubber and spring cushions adequate to perform vibration and shock control.

First experiments with the material, however, convinced Robinson's engineers that it could overcome many disadvantages found in currently used materials.

► **Forming Process**—The wire, approximately .003 in. in diameter, is first knitted, then processed continuously by compressing and folding. The material is then molded under high pressure into the desired shape. Resulting cushions will hold its form and maintain its elasticity under any loads which do not closely approach the pressure originally used in molding.

In special tests for Avionics Week,

4 points to remember about this baby gas turbine



This outstanding new gas turbine developed by Adressorh is essentially a jet engine itself. It is used as a source of power to start the big jet engines in today's modern planes.

Marmen couplings, specified at four important points on the baby jet, go a long way toward solving the many difficult coupling problems encountered in the design of such a product. Marmen and Marmen Products is relying on standard Marmen Preflexes to perform tasks which once required individually designed devices.

The Marmen line includes couplings for all types of joints—straps for supporting tanks and accessories—band clamps for all kinds of hose and flexible bellows. You will save design and production time and cost by designing Marmen standard types right into your product in the same manner that you would specify a standard nut or bolt.

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1. Small clamps for combustion chamber flow vanes



2. Multi-plate take-up clamp for position and of electric starter shaft and seal brush cover.



3. Small Clamps for flexible joint between combustion chamber and compressor.



4. Band clamp joining combustion chamber to turbine.

Vibrocheck mounts equipped with Met-L-Flex cushions vastly outperformed conventional rubber shock mounts. On test vibrators it was possible to balance mass in heavy weighted beam vibrating over 2000 cycles per minute. Uneven distribution of weight within the box caused no appreciable change in the shockiness of the mount. Conventional mounts on the test equipment vibrated to such a degree that it was impossible to read burrowing at close range on the damping box.

New Vibrocheck Fasten—Rubberized is not selling the Met-L-Flex cushions separately, but will include them in Vibrocheck assembly sales of which exceeded \$10 million up to the latter part of May, 1949. Currently the company manufactures the mounts in its Torrington, N. J., plant, and plans are now being discussed for facilities to manufacture the Met-L-Flex cushions.

Brake Anti-Skid Unit Cuts Landing Run

A brake attachment which automatically prevents skidding and is capable of substantially decreasing aircraft stopping distances has been developed by Boeing Airplane Co., Seattle, Wash.

The new attachment has been licensed to Hydro-Aero, Inc., Burbank, Calif., who will manufacture and sell the device commercially. It already has



ANTI-SKID DEVICE on the landing gear of a TU-95A Strikobomber is installed by Gordon Yarker, Boeing engineer in charge of the developmental program. This portion of the device, mounted in a bracket on the center of each of the plane's three main wheels. The outermost portion is the clotted driving link which engages hub cover pins of the landing wheel, while the actuator behind it is a housing which automatically sets the entire device.

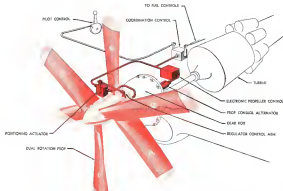
LET EX-CELL-O MAKE IT

Precision parts and sub-assemblies made to customers' specifications are an Ex-Cell-O specialty. Typical of Ex-Cell-O's products for the aircraft industry are the precision parts (at left) and hydraulic assemblies (above) shown on this page. Ex-Cell-O has complete engineering, machining, heat-treating, grinding, sub-assembling, and inspection facilities—all under one management, experienced management. Ex-Cell-O makes precision parts to your specifications, in small or large volume, and delivers them in accordance with your schedule. To see how this service can benefit you, write Ex-Cell-O in Detroit today.

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Special Multiple Way Bore Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Boring and Tapping Machines and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Grinding Machines • Precision Slotted Grinding Machines • Other Special Purpose Machines • Tool Grinders • Precision Grinding Tools • Driveshafts and Branch Shafts • Counterline Sets • Grinding Spindles • Hydraulic Power Units • Drill Rig Drillings • R. R. Piers and Drillings • Tool Machine Equipment • Dairy Equipment • Aircraft and Manufacturing Machine Parts and more





Aeroprops—with Electronic Turbo Propeller Controls

Precise Automatic R.P.M. Selection . . . RPM is automatically scheduled by the pilot's selection of an operating setting. The precise RPM for best performance and fuel economy is thus assured.

Instantaneous Control . . . Response of the system to a step is instantaneous. Pitch change is obtained by having components which are already in motion, that eliminate inertia and friction more fully.

Acceleration Sensitivity . . . Acceleration Sensitivity is a requirement for effective task execution

control because of the high inertia involved and the great sensitivity necessary to finely tune speed limitations. The Autopodage (neural provides simple, effective acceleration sensitivity).

Complete Safety at All Times
... Additional powerplant protection over that provided by the normal governing system is obtained from a single propeller-controlled hydraulic governor of a type proven by years of service. *Boeing's* system enables

early entering the feathering or negative throat blade angle ranges is provided.

• **Accessory Products Division of General Motors Corporation** has developed propellers and a control system fulfilling the requirements of turbine engine installations, and provide in addition automatic synchronization for multi engine installation. Let **Accessory Products**—backed by General Motors Research—help with your Turbo-Prop elements now.

been successfully tested on the Boeing XB-47 and YC-97A. It currently is being installed for testing on a Sikorski

► **What It Does**—Operation of the airplane's normal hydraulic brake sets a reaction on electrically controlled valve actuator which keeps braking pressure just below the skidding point at all times. This gives the plane maximum runway friction regardless of the type landing strip. Boeing engineers point out that a skidding wheel does not exert maximum steering power.

After the plane left the runway, the pilot applied his brakes as the usual common Normal braking action results until a fraction of a second before a crash would usually start on either or both sets of wheels.

► **How It Works:** At that point, deceleration of the wheels on the runway causes a supplemental valve in the low-draw system to open, and reduce braking power just enough to allow passengers to disembark without shed.

This cycle is repeated automatically as often as necessary until the crank comes to a full stop.

• **What it Is**—The control device consists of a rotary master mechanism and a system incorporating a flywheel, which holds contacts and clamping device. Alternatively used is an aluminum housing. The core of the flywheel shaft is enclosed on the shaft end of the landing wheel. The flywheel shaft is coupled to the landing wheel and turns integrally with it. An integral "fail safe" device allows normal braking should the second contact fail to engage.

An advantage of the new built device, besides shortening loading the tapers and decreasing sliding hazards, is the potential for lengthening the life

Attachment is claimed to be particularly applicable to tandem loading gear systems because of the unequal weight and load distribution between wheel, frame and engine.

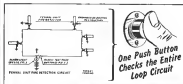
Old Files Reclaimed

A new electro-sticking process which restores shopworn files and taps to original sharpness has been developed at Fairfield Research Air Force Base, Calif.

When film is electro-charged in chromic acid, then dipped in a very strong nitric acid solution. They finally are re-dipped in chromic acid a second time to restore original brightness to the bath.

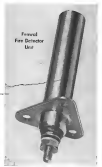
¹ The process was developed by Robert Rowntree, a civilian employee in the welding and plating section of the heat shop. It takes less than five minutes to complete and is reported to save the government about 30 cents on every 40-cent file destined for the scrap pile.

No other aircraft fire detector
circuit is so SIMPLE,
so FOOLPROOF...



UNIQUE FEMALE SAFETY CIRCUIT... single master/slave concept with ground wire... detector operates even if conductor is accidentally broken anywhere in the circuit... even a double break only eliminates detector located between broken cables; cables remain operative. Each detector operates independently — no averaging effect. The safety circuit is exclusive with Firestat.

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The Federal Aircraft Fire and Over-Heat Detector fully complies with CAA Technical Standard Order (TSO) as an adjunct with FAA Specifications A22.40. Write for details. Federal Incorporated, 77 Phoenix Street, Ashland, Massachusetts.

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and Over-Heat Detectors
SENSITIVE... but only to heat



Collins 171 and 518 in dual rackmount



Collins 518-2 vhf navigation receiver



Collins 37-1 vhf navigation antenna



Collins 37P-1 glidepath antenna



Collins 171-2 vhf exact transmitter



Collins 31V-1 glidepath receiver

NEW! Equipment to implement the VHF program



The development of a full line of navigation and communication equipment for aircraft use in the vhf and uhf bands is a continuing, fast-paced project at Collins Radio Company.

The purpose is to make available to the aviation industry complete, reliable, rugged radio facilities that require no special maintenance and communications over the Federal airways.

This program is closely coordinated with, and will progress with, the ongoing and long-range programs of the Radio Technical Commission for Aeronautics.

All of the equipment shown and briefly described on this and the opposite page is brand new, designed to the latest specifications for the applications defined.

518-2 Navigation-Communication Receiver

The new Collins 518-2 vhf receiver, available now, is a replacement of the 518-1, with which the airlines have been familiar since 1945. It covers the frequency range 118.0-136.0 on a 100 kc channel basis. Full performance characteristics are printed in the receiver and accessories for reception and presentation of all radio services now available in this portion of the spectrum.

The channel selection circuitry of the equipment are arranged to accommodate addition of a glidepath receiver, such as the Collins 31V-1, to the system. This choice of appropriate receiver and glidepath channels is afforded from a single control unit. The 518-2 receiver is also designed for use in a combination unit with the Collins 171-2 vhf transmitter, the two together forming a two-way vhf voice communication equipment.

37-1 vhf Navigation Antenna

The new Collins 37-1 antenna is designed for use with the 518-2 receiver. Its band width is 106-132 mc at 2/1 standing wave ratio or better, to feed a 31 ohm unbalanced line. The drive is only 3.60 watts at 290 miles per hour.

The 37-1 is constructed of cast aluminum, stainless steel and galvanized mild steel, and weighs 3.75 pounds. It is CAA type air certified and meets interchangeability with the type AS 11/ARN antenna.

31V-1 Glidepath Receiver

The Collins 31V-1 glidepath receiver, now in limited production, provides reception of 90/120 cps tone modulated glidepath signals on any of the twenty channels in the uhf range of 329-355 mc. This receiver functions with the Collins 518-2 navigation receiver and RMI ILR receiving requirements for military, commercial and private aircraft. Design of the 31V-1 receiver is based on "Glidepath Receiver Characteristics" issued by Aeronautical Radio, Inc., and on U. S. Air Force specifications.

Output sensitivity of the type 31V-1 receiver has exceeded 100 uV/ARN deviation, modulation achieving flag alarm. By means of the flag alarm the pilot has a positive indication of the reliability of the glidepath signals and instructions.

The 31V-1 receiver control elements are integrated with the standardized RMI ILR channeling system with channel selection provided by means of a Collins 304U remote control unit.

37P-1 Glidepath Antenna

The new Collins 37P-1 antenna, for use with the 31V-1 glidepath

receiver, is engineered for reception of horizontally polarized signals in the range 329.126 mc. A standing wave ratio of less than two to one is obtained over 250 mps with the antenna mounted in 32 ohm coaxial cable. The 37P-1 is constructed for mounting horizontally (0/90°) on the nose of an airplane with the nose fitting protruding through the skin of the ship. The design is such that it may be used on pressurized cabins. With this antenna properly mounted, an increase of from 6 to 18 db in voltage pickup is obtainable over ducted antennae now installed for this use.

171-2 vhf transmitter

The new Collins 171-2, available only this fall, provides two-way voice facilities on all channels reserved for aircraft communication in the vhf band. Its frequency range is 118.0 to 135.0 mc, and all of the 180 channels assigned in this range are only

selectable over a simple and positive remote control system. The power output on phone is conservatively rated at eight watts, assuring that transmissions will be received and acknowledged at the busiest air terminals.

The 171-2 transmitter is intended as a replacement equipment to the Collins 518-2 vhf navigation communication receiver. This receiver, together with the 171-2, will provide full two-way voice communication facilities on all Federal airways vhf communication channels.

Illustrated features are available, providing more detailed description and the operating specifications for these two receivers and the transmitter, together with their accessories. You are invited to write for your copies.

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You can count on Packard ignition cable for more hours per replacement—because extra endurance is built right into it. Added HPR* is the natural result of Packard design and manufacture. Here is cable in which are combined all the know-how and specialized skills that Packard has gained through years of leadership in cable progress and development. Here is cable possessing unequalled resistance to heat and cold, moisture and abrasion, age and corrosion.

For extra hours of sure-fire ignition, for maximum reliability under all atmospheric conditions, from sea level to ceiling . . . in all parts of the world . . . specify Packard high-altitude ignition cable.

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PRODUCTION

Job Evaluation Trends Studied

Survey of seven Long Island aviation plants indicates growing usefulness of system that started during war.

Job evaluation in the Long Island, N. Y., segment of the aircraft industry has survived the war to the satisfaction of the companies using it. Indications are that it will continue with modifications.

A recent survey by William Schweitzer, formerly of Schweitzer Aircraft Corp., Elmsford, N. Y., and now teaching industrial management at the Long Island Agricultural and Mechanical Institute, disclosed two distinct systems of job evaluation used by five of the seven leading manufacturers of air frames and accessories from which detailed information was obtained.

The study was made, according to its author, to give management a factual picture of the extent to which job evaluation is employed, what system is used, and what future trends may be expected in the industry's wage determination process.

With Established—Schweitzer reached these conclusions:

- Job evaluation is well established in most of the companies surveyed and is no longer a tentative measure to correct wage inequities in a rapidly expanding industry.
- Companies using the point system are well satisfied, for the most part, with its effectiveness for factory, clerical and technical non-supervisory jobs. Ten days now it is expected it is up over thirty levels.
- Some type of job evaluation system, typically based on individual judgment, like the point system appears necessary where a union is involved, to put management in a defensible position in terms of pay for the related jobs.
- Workmen point in the formal wage determination system is merit rating. Job evaluation determines the relative value of jobs, while merit rating shows the relative value of individuals in the job.
- Two Systems—Two distinct systems of job evaluation are in use at five of the companies surveyed. Two others the largest and the smallest, did not have any formal plan.

Of those firms that use the point system (individual job breakdown and analysis) and the fifth used the relative system (total job evaluation in relation to other jobs involved).

Three of the four using the point system are employing the National

Metal Trades Assn's job rating plan. Let's first develop its own methods.

Merit rating, in all cases, was disclosed as the most vulnerable component, for as the report points out, "when people rate each other almost anything can happen." Several firms were found to be looking for a more objective approach in the practice.

• **Grassman Objectives**—Objectives to the job evaluation principle arose from Grassman Aircraft Engineering Corp., largest of the seven surveyed. Grassman gave these reasons for not having a job evaluation plan at its Bridgeport plant:

- (1) The company believes people want to be treated as individuals and do not like to be classified.
- (2) The aircraft industry is a low quantity production industry which has great variety in its tasks for factory personnel. Moving classified employees from job to job creates supervision and wage administration problems.
- (3) One of management's policies is to eliminate as much regulation as possible, and a job evaluation program would not fit into this philosophy. At present, Grassman does not have a set of company rules.
- (4) Former wage freezing put aircraft companies in a poor competitive position in the labor market. Grassman has met this problem with an incentive bonus plan by exception and based on the man-hours required to build a panel.

of expense.

(5) Grassman, which has no union, employs good labor-management relations. And it considers its position favorable in a competitive labor market.

• **H. H. Wood Plan**—H. H. Aircraft Co., Inc., at Farmingdale also without a union—told Schweitzer that it used a job rating system installed by an outside consultant during the war.

Management, in addition to finding needs for new operations at Grassman, was dissatisfied, feeling the plan was not tailored to the company's individual needs. A union contract violation and a salary declassification of the union made this situation possible in 1947.

B. H. also has an incentive bonus, based on overall production, paid quarterly to everyone but executives.

• **Liberty Has One—Liberty Aircraft Products Corp.**, Farmingdale, union and after the war and installed a job rating system in 1946.

Management told Schweitzer that jobs, after study, were divided into two grades on the basis of the following factors: relationship to other jobs in the company, community rates and relationship of similar jobs in three points system.

With union cooperation, Liberty has developed general descriptions which permit the reengineering of jobs and then conversion to meet the changing demands of a low production industry. • **Republic and NMTA**—Republic Aviation Corp., another Farmingdale firm, uses NMTA point system for both factory and salary personnel, and recently expanded their point plan to include top supervisory and executive levels. The survey shows that Republic executives have willingly accepted this reduction in the plan and show more or less than factory workers in their classification and rating.

Although merit rating, as part of the plan, was abandoned after the war, Republic still feels the necessity for com-



SEAGUARD L-13

Equipped with Edo float, seaplane version of Grumman biplane plane class across Sea.

Deep Bay during initial water trials. Vertical fin has been added.



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Stuck up the Linden Airport as the fastest, most conveniently located major air field under private management in the New York City metropolitan area. Able managed by Robert Mervin, President of Skyover, Inc., the Linden Airport has complete modern facilities. Three well-paved runways, (N.W. SE 2200', N-S 2600', E-W 3150') 80,000 square feet of heated hangar space. A tie-down system 900' long and 400' wide. Plus complete CAA approved facilities for major and minor aircraft engine, instrument and propeller repair work.

There's never a landing fee, and you'll find it as convenient as it is economical to start your plane at Linden. Be sure to make Linden Airport your stopover point when visiting in the New York area. Three major bus lines pass the door, plus Pennsylvania rail connections direct to New York.

SALES & SERVICE



NEW MEMBER OF CAGA, Bill Olson (left) gets certificate from William B. Belden.

Report on Use of Business Planes

Corporation Aircraft Owners Assn. meeting hears problems of operation and studies extent of use.

American business firms are currently using about 7,000 airplanes for industrial travel, it was estimated at the Corporation Aircraft Owners Assn. forum in Washington last week. This includes 1,200 multi-engine and 5,800 single-engine planes.

Robert Aldrich, director of the Miscellaneous Air Traffic Authority, and representative of Airport Operation Council, urged cooperation-owned aircraft to expand operations on service at airports, to the airport managers, for removal action. Aldrich said that success in securing airport status, whether executive or personal, was handled at virtually all the larger airports by local business aviation committees. In only one case at a larger field (LaGuardia) is such service handled by the airport management directly. It is part of the manager's duties, Aldrich said, to see that the operation goes proper service, and reports from the executive plane operators will help him in performing this job.

► **Individual Users**—Programs of commercial aviation depends largely on the extent to which the American business class and director can use airplanes in increasing numbers, Joseph T. Gostling, Jr., manager of the Aircraft Industries Assn.'s personal aircraft council, told the meeting.

Gostling pointed out that the rapidly increasing use of larger multi-engine executive transports by top industry personnel would logically be accompanied by increasing use of smaller single-engine planes for sub-executive and sales staff.

Gordon Skaper, New York aviation insurance man, outlined control points in an insurance program for corporate aircraft. A sample program for a twin Beechcraft owned by a large company, and valued at \$51,000 included the following: full coverage, all risks ground and air, no deductibles and no co-insurance, \$4,250, liability including coverage for public liability and property damage, and admitted liability for passengers and crew \$2,000.31, a total annual premium of \$6,000.31.

► **Liability**—Vance-Skaper pointed out the program would vary depending on degrees of management whether legal liability only would be covered as to passengers, or whether an admitted liability program would be chosen, making it unnecessary for passengers to bring suit to collect for injury.

Walter Page, Ames Steel Corp., Middletown, D., executive plane pilot, discussed safety operations, and Gola Moore, executive pilot for J. J. Galt Co., discussed proper flight operation procedure aimed at saving executive air travel to passengers. He prescribed "no sudden movements, changes of course, or changes of throttle setting," but gradual, smooth changes well planned to avoid abrupt and disconcerting action that worry the passenger.

► **Passenger at Control**—A poll of other pilots present indicated a majority favored the idea of letting passengers try out the controls under supervision in the on pilot's seat to get a better idea of the airplane's operations and stability in flight.

C. B. Colby, executive secretary of CAGA, reported that there are nearly 100 executive planes now in the "CAGA fleet."

► **Olson Membership**—William B. Belden, Republic Steel Corp., Cleveland, chairman of the CAGA board, presented a certificate to Bill Olson, signifying his honorary membership in the association. The award would have been awarded Olson Aviation Corp., Teterboro, N. J.

Attendees included representatives of approximately 11 non-aviation firms using executive planes, in addition to approximately 90 representatives of various aviation interests.

Aeromatic Licenses British Firm

Licensing of the British firm of Hendrickson Ltd., to manufacture and sell Aeromatic propellers in British areas, Africa, Western Europe and Scandinavia, opens under the new British country market to the Aeromatic-built propeller which Hendrickson has been producing for the American market since 1950.

Koppers Co., Inc., corporate U. S. Aeromatic licensee, and Everett Propeller Corp., developer of the Aeromatic, will aeromatic propeller plant in New York City.

Bel Froben, Koppers' Aeromatic department manager, and his technicians will work with Hendrickson in setting up manufacturing facilities in England. The British plant has specialized in design and production of variable pitch propeller blades made of Hydrinax, a laminated duralumin wood material, and successfully on military aircraft with horsepower up to 1,000 hp.

The British firm has agreed to establish service facilities, aviation representation, and conduct technical development work for fitting the Aeromatic reliable European engines and aircraft.

AIR TRANSPORT

Lessons of the Mt. Carmel Crash

Industry and government work out safety measures that reduce danger from smoke or gas in cockpit.

New safety measures to reduce the hazard resulting from intrusion of smoke or gas into transport plane cockpits have been adopted by airlines as a result of the United Air Lines DC-6 accident near Mt. Carmel, Pa., on June 17, 1948.

An official report issued by the Civil Aeronautics Board this month said the probable cause of the UAL mishap was incapacitation of the crew by a concentration of carbon dioxide gas in the cockpit. This gas escaped in after the crew discharged at least four bulk of carbon dioxide fire extinguisher bottles in the forward cargo pit following a false fire warning.

Prevention. Presumably, at the time of the accident, UAL was preparing a company bulletin specifying additional precautions DC-6 crews should take to guard against carbon dioxide concentrations.

Based here in Los Angeles to New York via Chicago, the DC-6 departed following normal while flying over Pennsylvania a few minutes before the crash. Three UAL's radio operator at LaGuardia Field heard a voice calling loudly and repeatedly.

Gasbled Transmision.—Crew of a United DC-6 flying behind the DC-6 heard "incoming vessel" calling New York. After no satisfiable transmission, the DC-6 crew reported it was making an emergency descent.

Although there were visible areas where an emergency landing could have been made, the plane came down to less than 1000 ft. minutes an engine engine and crashed into a hillside. All 41 persons aboard were killed.

Values Not Overruled.—CAR said the physiological and toxic effects of high concentrations of carbon dioxide gas in the cockpit had probably incapacitated the DC-6 crew physically and mentally incapable of performing its duties. The Board noted, however, that the high concentrations of gas probably would not have occurred if the crew had opened the cabin pressure relief valves in accordance with CAA-approved procedure for opening the fire extinguisher relief system.

It is not safe to assume that the pilot and copilot, under emergency pressure, will always behave rationally by the sequence of steps outlined in CAA's

Agency of Airplane Operating Manual," CAR continued. "Too little consideration has been given to the psychological and physical limitations of crew members in time of stress and danger."

The Board said design of aircraft controls, especially those used in emergencies, should take into consideration the limitations of human action. To simplify emergency procedures, Douglas Aircraft Co. has designed and is testing a modified fire extinguisher system, which will permit all necessary steps to be executed by the movement of one control. An additional seat also is being designed to reduce carbon dioxide concentration in the cockpit.

Media Ordered. Under sharply after the Mt. Carmel accident, CAA directed all airlines to advise the flight crews of all aircraft to wear oxygen masks and initiate emergency cockpit smoke disposal procedure when carbon dioxide is released into any fuselage compartment with other than portable extinguishers. All scheduled U.S. airlines operating DC-6s have equipped the planes with demomotype full size oxygen masks for crew use.

The false fire warning on the UAL DC-6 was one of many tested in a detection device during the first half of 1948. Scheduled airlines approved

32 false warnings of fire detectors in baggage compartments and 285 false warnings by smoke detectors in the aircraft fuselage.

Detectors Discarded.—As a result of these false warnings, CAA on Apr. 28, 1948, authorized airlines to disconnect smoke detectors units where false alarms were shown to be caused by the auto themselves, not by faulty installation or maintenance. On June 18, following the accident, CAA permitted the carriers to disconnect all smoke detectors.

Efforts are presently being made to improve the reliability of the warning devices sufficiently to permit their installation in all airline transports (Aeronautics News, June 6).

Six months prior to the UAL accident, tests showed that sufficient carbon dioxide could accumulate in a DC-6 cockpit to cause partial incapacitation of the crew. As a result, facilities for greater ventilation were provided in the cockpit and cabin.

Even so, Douglas in its second report on the operation of the fire extinguishing system warned that failure to open the cabin relief valve in the UAL case apparently failed to do so might result in excessive amounts of carbon dioxide in cockpit and cabin.

ALPA Warning.—Only two months before the UAL accident, CAA received a letter from the Air Line Pilots Assn. asking the need for providing all cockpit personnel with smoke masks and increasing the carbon dioxide hazard. CAA then solicited a method study of the effect of smoke and noxious gas on flight crews, but the work was not completed until after the Mt. Carmel crash.

Early a month before the UAL



LETTERS FROM THE LOOP

Inspection of helicopter service operations in the Chicago area this month provides 30 minute service between the airport, Helicopter Air Service, Inc., Bell 47D.



"The newest thing in Helicopters"

... attains maximum strength and lightness with SHELBY Aircraft Tubing



Douglas and engineers of the Kaman Helicopters show SHELBY Tubing because they know they've ordered it. A. The new cabin structure is made in only one piece. B. SHELBY Tubing is available in standard, lightweight, and heavy-duty sections. C. SHELBY Tubing is available in a variety of sizes, and in the correct alloy.

The new Kaman K-190, which recently passed its structural tests last year, is now in production for commercial use. The "definitely different" machine is unique in its use of dual, interlocking tubes, and in the mounting of a pilot-controlled servo flap on the rotor blade which gives the craft pronounced stability and maneuverability.

Designed to be used as a piece of industrial and agricultural equipment, the K-190 features dependability of operation, maintenance of construction, and easy accessibility for maintenance. These desirable properties are realized largely by the use of Shelby Seamless Aircraft Tubing throughout—in the rotor shafts, landing gear, fuselage and controls. All tubing is SAE 34430, chrome molybdenum steel. Approximately 310 individual Shelby Tubes

are welded to form the basic fuselage structure.

It is because Shelby Seamless Tubing brings weight to the very maximum and yet gives the utmost in dependability and shock-absorbing qualities that designers have for years used it in aircraft of every type and every size. With no other brand of construction can you build up strong, air light, and so durable in high stresses and strains.

The uniformity and dimensional accuracy of Shelby Seamless Tubing is why it is used in the design of almost any type of aircraft—no other tubing provides that precise, completed parts and joints with 100% efficiency, available to help you achieve the utmost in structural efficiency. Our engineers will gladly assist you in applying SHELBY Seamless Tubing to your design.

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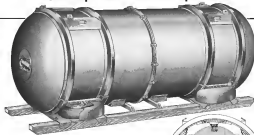
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The AIRPAK is another in a long series of Firestone developments that has helped make aviation history. If you have any problem involving the use of rubber or rubber-to-metal, our engineers will be glad to work with you. Simply write The Firestone Tire & Rubber Company, Aviation Products Division, Akron 27, Ohio.

Circle 11 on Reader Service Card



Air Seal and Oil Seal



erly, a TWA Constellation crew had a false fire warning in a forward cargo compartment and released carbon dioxide in the crew. Although partially incapacitated, the TWA crew made an emergency landing at Clatskanie, Ore.

ATA. After following this incident, CAA made tests with the Constellation that pointed up the danger of oxygen deficiency in the cockpit when oxygen dioxide bottles are pulled in the cargo compartment. As a result, the Air Transport Act, on June 19—two weeks before the Mt. Carmel accident—mandated DC-6 operators by telegram that a similar situation might cost on the Douglas and related making tests.

On June 14, Douglas wired ATA it had made carbon dioxide smoke evacuation tests on the DC-6 at the previous February with results entirely satisfactory to CAA. Douglas told ATA: "Please contact all occupants of your June 10 wire and withdraw any reference to DC-6 aircraft, as tests you requested are extremely hampered in conduct. Recommendations regarding smoke evacuation for other aircraft do not necessarily apply to DC-6."

ATA advised its members of the Douglas telegram. Nevertheless, on June 15, United decided to instruct all its DC-6 crews to use oxygen masks when carbon dioxide was released. A company bulletin was being prepared when, two days later, the DC-6 crashed at Mt. Carmel.

Alaska Fined

Alleged safety violations bring heavy penalties from CAA and CAB.

Severe penalties for infractions of federal safety regulations were assessed on Alaska Airlines last month by the Civil Aeronautics Board and Civil Aeronautics Administration.

Certificated within the territory of Alaska, and operating unscheduled or commuter air routes in the world, the Anchorage-based carrier was cited for a series of offenses most of which occurred during the past year.

Retrospective. Responded—As a result, CAB suspended Alaska Airlines' unscheduled operating certificate "until such time as CAA safety agents have made a complete examination of company equipment and operating methods to determine whether (Alaska) is able to conduct safe operations in accordance with the requirements of the Civil Aeronautics Act."

CAA Administrator was empowered to terminate this suspension upon completion of the examination.

CAB also limited Alaska Airlines to daylight VFR (visual flight rules) operations under its scheduled operating cer-



SEATTLE-TACOMA DEDICATION

Collapsing of the Pacific Northwest's crowded airport was the crowning event of 50,000 persons who turned out to the recent dedication of the 113 million Seattle-Tacoma

Airport. On display before the \$7 million transportation building were both airline and military planes whose interiors were open for public inspection.

reflects the seven days. Authority for construction of complete scheduled and unscheduled night flights was to be given only after CAA made certain that the company was properly equipped.

\$20,000 Fine—CAA and it would agree to consider accepting \$25,000 as an offer of compromise from Alaska Airlines for offenses already assessed against the Civil Aeronautics Act. CAA said penalties of \$100,000 in penalties might have been sought.

Complaints. By CAA against Alaska Airlines charged the company with:

- Firing from the U. S. and Alaska to flying countries without an air carrier operating certificate authorizing such service.
- Operating engines in excess of the maximum allowable period between overhauls.

- Failing to provide an adequate number of check pilots to meet that end. Pilot employed on route certificate requirements.

- Utilizing numerous pilots in excess of the flight time limitations.

- Using a pilot who had flown over night hours the previous day and had not had 24 hours rest.

- Using a cockpit not qualified on the type of equipment operated.

Last November, the carrier allegedly lost Alaska Airlines' "Moose" as a result of a flight, whereas no pilot was employed in the company.

Accident Cited—On Jan. 20, 1949, an Alaska Airlines DC-3 bound from Nankov to Anchorage crashed into a mountain. The flight was scheduled to be operated by a "pilot error" in the company considered them to be.

- Used a captain on the flight who had not been properly qualified over the route by a company check pilot.

- Dispatched the plane when weather reports and on the clearance were over 1 in 10 min. old at departure time.

- Operated at night from Homer to Anchorage under visual flight rules when instrument flight rules were required.

- Operated the flight at an altitude of less than 1000 ft. above the highest obstacle on the route in violation of regulations.

Previously, the company had a fatal accident at Seattle-Tacoma municipal airport on Nov. 10, 1947, when a DC-4 ran off the end of a runway, killing eight passengers, a co-pilot and the air marshal of an intermediate on an adjacent highway.

Other Penalties—Alaska Airlines reportedly certified its world-wide charter and non-scheduled activities during the period just prior to the CAA-CAB disciplinary action. Coincidentally with the safety penalties, the company was fined \$14,000 in Alaska district court and President James A. Wooten was fined \$100 for violating an existing court order against U. S. Alaska flights. A further \$25,000 fine was suspended contingent on future compliance with the restriction.

Alaska Airlines Board Chairman Raymond W. Marshall said his company did not admit the visibility of charges against it but agreed to the fines to avoid litigation. He said many of the charges against Alaska would not have been considered violations if the scheduled flight in question had been regarded as "private carriage" in the company considered them to be.



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thority's promise to put in pushing legislation to end its monopoly to suit. As the Port of New York Authority has seen the pattern for virtually every other public authority in the country, this statute of the transportation may precipitate a nationwide reform.

This is touched on by American's president C. R. Smith in an exclusive statement to Aviation Week.

"The lack of agreement between the Port Authority and the air line has undoubtedly demonstrated that no real and lasting basis for mutual effort will be found until both parties are reasonable for their own and their undertakings can be advanced in the same courts which have production over comparable agreements by other parties."

"A solution to the problem has been long delayed by the intransigence of the Port Authority (but it cannot be applied to suit to enforce its undertakings). Thus, as the new agreement, has been overcome by an obligation to support legislation which will make that possible and more."

Also pointed in the compromise.

- Fees may be used each year in accordance with maintenance and operating costs of the airport.
- Provisions will be made for arbitration of any future disputes arising over the issue.

The five airlines agreed to encourage other airlines to exercise loans similar to those outlined at the meeting with Governor DeWitt. Some terms of the loans.

- Port Authority will guarantee loans with 10 percent of total cost to be paid in advance by the airlines. Airlines will pay 105 percent of the total cost in addition to an annual interest rate of \$1300 per acre. (In Alaska, construction begins on three airports.)

- Airlines may build their own hangars by paying the new ground rent, but ownership is to be vested in the Authority after construction.

- Airlines will pay 55 per cent of the temporary terminal building for common space 54 per cent of the first floor space 55 per cent of the second floor space and 52.50 per cent of the third floor space. (The Port Authority Authority's common use facilities a \$1.1 million increase for an expansion to the terminal building.)

July Traffic Falls But Profits Steady

Domestic air lines ended a slide of the latter with the worst in domestic and traffic reports issued early this month.

Most glowing profit statements from first half 1949 business were announced. Considerable, preliminary estimates showed that passenger loads during July fell off noticeably from record June levels.

► **Accidents Merit**—The Air Transport Association about the middle of July estimated that revenue passenger miles flown by the 16 domestic trunklines during the month would be 5 percent below July 1948 traffic. It also reported that traffic slipped noticeably about fatal crashes involving a non-scheduled Stroud Airlines C-46 in Colorado and a KLM Constellation in Idaho on July 12, a scheduled Air Transport Constellation C-46 in Seattle, July 16, and an Eastern Air Lines DC-3 near Fort Dix, N. J., July 31.

As a result, July's domestic revenue passenger mileage a year extended all possible below June's although well above July, 1948. Last year, the June-July decline was only 5 percent. Despite the slackening in passenger business, the curtailed domestic carrier as a whole were expected to be well in the black for last month.

► **New Reports**—Meanwhile, new financial reports for first-half 1949 showed generally excellent savings.

► **American Airlines** announced a \$1,536,000 net profit after taxes compared with a \$4,893,000 net loss for the first six months of 1948. Total revenues of \$49,752,000 represented a 39 percent gain over last year, with gross passenger income up \$6,610,000, net up \$911,000 and cargo up \$223,900.

Operating expenses rose about 8 percent over first-half 1948. Of the 55.5 million increase in costs, flying expenses (including primarily of crew salary, fuel and oil) accounted for \$2.1 million.

Although July traffic was about 10 percent below June, AA expects business will improve during the last two months of this year.

► **Chicago & Southern Air Lines** earned \$295,621 net profit in first-half 1949 against \$287,682 in the same period last year. About \$200,000 of this year's profit was on domestic operations and \$14,000 on international routes.

Domestic passenger revenues rose 8.1 percent, while mail and cargo declined 9.4 percent from 1948 levels. Domestic route loads for the first six months of this year were 5.07 cents down 7.5 percent from the 4.29 cents in first half 1948.

► **Northwest Airlines** reported a \$70,201 net profit for second quarter 1949, reducing its first-half deficit to \$119,185. Operating under duress in April, May and June, when its post-war management has generally not started until the summer season.

► **Northwest Airlines** estimated its July net profit at \$1,585,881. July profit determination has not yet been made, but probably will be lower than June's net profit of \$1,072,000. Carrier's net profit for the year to the end of June was \$490,915, compared to a net loss of \$2,616,296 for the first six months of 1948. July, 1948 revenues were \$3,272,404.

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STRICTLY PERSONAL

LET'S MULE THIS ONE OVER:—The other day *Charlie Flock* of CAA's information office was running through ads submitted to CAA for his money-magnum aircraft use in 1987, and got this extra line. In tracing NC 52404, H.F. Gossney, CAA aircraft agent, had discovered that this ship had been sold by a young resident to a *Mr. Benson*. Er, *man*, who he been *traded* it for a *Crowley* car. The car dealer traded it to somebody else for a *mule*. *Charlie* keeps wondering which one is better share, the *alone* or the *mule*.

THE TIE-DOWN THAT COULDN'T BE—Arlene ground equipment personnel meeting in Miami recently to think out their problems couldn't understand why the situation rate of one particular type of tie-down equipment was so nearly 100 percent that they were having to abandon it for another device. Charles Adams, our Transport Editor, says they finally discovered that the item was basically useless for use as hammocks in the backs of the light-colored

A MENACE TO NAVIGATION—Al Wall, the well-known ADPA and Philadelpha insurance mogul, scribbles a memo to tell us about the captain who led to charges let navigator because he couldn't tell his stomach from a hole in the ground.

THE PAUSE THAT REFRESHES—Mr. Edgar S. Boyd, who spent just two years and six months at the top of the food chain at the company, is stepping back to help his son, who is taking over the company. Boyd is stepping back to help his son, who is taking over the company. Boyd is stepping back to help his son, who is taking over the company.

THIS PLANE STINKS—*Bob Strommen*, who now handles publicity and advertising for another people (ah!)—writes from his New York office at 475 Fifth Ave. that our item on OAL search alerts July 11 reminds him of wartime pilot instruction at Reno Howard's Hawthorne Field.

*Taking off at a stop with his first student, an instructor suddenly noticed a very foul odor. He looked the ship, wrote out Form 1, saying, "This plane smells." Dispatches gave him another stream. Some things happened. Dispatches turned over Plane No. 5. Some story. Finally, a nurse heard what was going on and solved the mystery. The very pungent odor was inside from paper mills at Charleston, S. C., 75 miles away, very noticeable under certain wind and heavy air conditions.

ARE YOU LOST? FIND YOURSELF HERE!—Louise Thaden suggests we start a lost and found department so we can ask what has become of Mac and Jew Fields? Does anyone know?

WAS IT A MOTORIZED HELL BARKER?—Correspondent Bud Roberts at Beaver Dam, Wis., turned off a highway that a certain law student near Grover says is the worst road in the state. The road is just a dirt road, because of their spite. The field was made into a trap. It seems that not many weeks ago five others complained to authorities that he was laid off, taking his baggage to his schoolhouse. Well, the countess found the wicked, empty schoolhouse at the airport. So, the law says if these five people want his crown off the Gold they better build a fence.

WELL, A LADY CAN'T BE TOO CAREFUL—Robert D. Hosenstein, New York sales manager for U.S. Airlines, writes this maily happened:
 "A female traveler called the U.S. office the other day and asked what time the midnight cargo plane left for Atlanta. The answer we gave her was 'Midnight Madness.'"
 R.H.W.

WHAT'S NEW

New Books

"Constructive Uses of Atomic Energy," edited by S. C. Hoffmann, contains 14 articles by atomic research scientists on the use of the atom in such fields as aviation, industrial power, chemistry, and crimes. Published by Harper and Brothers, 49 E. 33 St., New York 17, N. Y.

"*Australian Aviation Annual, 1949*," edited by Stanley England, replacing the *Australian Aviation Yearbook*. It covers mail and military aviation, maps, history, clubs and model building.

Trade Literature

"Service Bulletin," a supplement to the BC service and maintenance manual, containing inspection standards for the BC platinum alloy fine wire type spark plug electrodes, available on request to BC Corp., 156 W. 51 St., New York 10, N. Y.

"Apron-Spade," a 12-page booklet describing an alternating current motor, available on request to Louis Allis Co., 427 E. Street St., Milwaukee 2, Wis.

"Project Squad," a four-page folder describing equipment and procedures developed and used in basic studies of subject progress by the Research &

views of New York University. Available on request to V. W. Fike, Bureau of Public Information, New York University College of Engineering, New York 53, N. Y. Includes 10 cents to cover handling and mailing cost.

*"Test Catalog No. 30," containing information on performance of various units, available on request to Terburk Appliance Corp., Sherburne, N. Y., or company's representatives.

"Bulletin" P-2001," detailing a starter relay for aircraft jet engines and ground powerplants, available on request to Harrison Electrical Manufacturing Co., Mansfield, Ohio.

• Bulletin describing the New Britain Grindley Machine Division premises housing machine is available on request to New Britain Machine Co., New Britain, Conn.

Folder listing known applications for low temperature melting alloys is available on request to Corro de Puzo Copper Corp., 40 Wall St., New York 5.

ADVERTISERS IN THIS ISSUE

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LETTERS

'Free of Opinions'

Your efforts to keep *American Wake* up to date with all the latest news so vital to us in motion and free of opponents and their smear campaigns so common in this day makes your magazine topic as hot as I am concerned. I can read *American Wake* from cover to cover and copy every page and never feel like I am being read in a place where the owner's personal grudge against the people of America etc.

Europe & Beyond
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Kansas City, Mo.

Pity the Poor Owner

I just picked up *Avatar* Week for June 27 and the first thing I saw was "Midget Cynic" in *Review* by Deiders and Distributors by Alexander McIlwain. It was a very interesting item, and I was impressed especially by the report of H. L. Wheeler of *Atlanta Amusement Co.*, analyzing his sales from operators, showing that approximately 15 percent of his sales amounted to 50, or less.

For a pilot and airplane owner, it is very interesting to see how they lost on the other side of the trade.

Mr. Wheeler is bemoaning the fact that his shoes are too big. He says, "I want to find some way of having his customers spend more than \$5 at a time. I can tell Mr. Wheeler who was in which he can recover his business. All he has to do is to get my power applied into his shop for a year or so in annual licensing, and he will eliminate the \$5 order. The poor owner won't have \$5 left to buy anything else."

I live in Iowa, maybe ten weeks ago
 picture of someone people, suddenly all
 the water in reaction, who were discussing
 the fact that the plane was not flying
 them that into consideration, and the plane
 the poor woman, like seems to be a source of
 supply of nothing but dough. I just had
 my plane returned for a while, a regular
 flight, and I was told that I was not to
 license an airplane that didn't have a
 license.

It is a good airplane. The inspector that
 looked over my PT 18 and it was the best
 airplane he had looked at in two years, and
 it was a shame that I had to do the 100 hours
 of flight. I was told that the plane was a
 plane, and it was a plane that didn't
 need more, and just because a few of these
 planes were found with rot in the wood
 spars. Everybody had to do it, and it cost
 me \$25, thereby taking the joy of flying
 out of me. I was told that this is the
 point in the business, and it is.

Name of the people that you mentioned is to the pass showing of provide living give a thought to the regulations imposed by the CAA or the cost of operation and ownership of airplanes. I have been flying planes since 1923, and have seen a lot of these come and go, and there have been plenty more.

left system via the gelatin than those
have by accident. If the present be

would pay a little more attention to the poor sector who owns no airplane, and thought more of making his flying affordable, private aviation would expand instead of shrink.

H. Davis, Rogers
Radio Music Co
Seneca Falls, New York

Misplaced Effort

I have read with much interest your editorial comment July 15 entitled, "Why Learn to Love Death?"

Our company is exposed to the overseas and management of large creative assets and holds a CAA certificate in a large foreign firm. The purpose to which the certificate is put is strictly in the line of our business—i.e., we substitute one of our creative creative assets with a secret of a secret is tied up for management, creative assets to creative assets of our clients whose companies do not own that type of, and occasionally handle an ambulatory subject.

Yet a protest has been entered with the GAB by legal counsel of every leading airline in the country!

It appears that not enough emphasis is being placed upon the maintenance of the aircraft being used in the transportation of people for hire, and too much time and money that should be used for this purpose is being consumed in the manner you describe.

WILLIAM F. REMMONY, President
Remmony Wiring, Inc.
St. Louis 21, Mo.

Stall-Spin

[illegible]

In 1943, the last period for which we can obtain comprehensive figures from the C&E, the European economy showed some

pages with all other page content are listed below.

	average	all other years
Number of Wild Aids delta 1990-1991	91	1186
Number of Fatal Road Accidents	2	622
Percent of Road Accidents which were Fatal	2.2	52.5
Approximate Number Employed Jan. 1, 1991	1142	91,041
Total Fatal Road Acci- dents per 1000 Persons Employed	0.72	6.9

The above statement proves that the first accident, resulting from staff in the Erzsébet are less than aircraft those of other aircraft when based upon the number of aircraft registered. Of course, the number of aircraft registered is not a good indication of the exposure to risk, since the number of hours of flying and the type of flying has a great deal of bearing on the exposure. Details at that nature are, however, not available and I therefore base the percentage on the justification as being the best available statistical measure.

It is further to be noted that, although we have a substantial number of stall accidents, the percentage of stall accidents producing fatalities is much less in the Erroplane than in other aircraft. We have tried to digul from people's minds that the Erroplane is a first proof airplane, since we know it is not. However, statistics here and again prove that although people have almost as many accidents with the Erroplane as with other aircraft, the resultant injury to personnel is much less severe. We attribute the low

larity was from European stalls to the last first, in addition to not spinning, the European does not drop its nose severely when stalled and therefore the vertical velocity at the time of impact is much lower than most other stalled aircraft.

R. Sargent, President
Sargent Aviation, Inc.
Baltimore, Md.

USAF Contracts

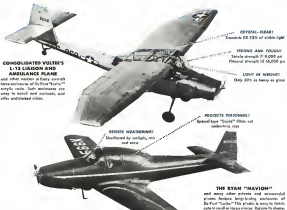
Your weekly feature, "Latest Ref Awards To Industry By U. S. Air Force," is an interesting and useful section, but we noticed you once included a section on invitations to Ref which we thought was of a value incomparably greater. We would like to see this made a regular feature of your magazine but it effectively gives the great many smaller companies of the aircraft supply industry continuous representation in *Air Materiel Command*.

We think you have by far the best trade paper in the industry, and we wouldn't be without it.

E. G. CHERRY
Director of Engineering
Aircraft Development Co.
Pasadena 3, Calif.

{Air Force discontinued the list of invitees to bid until after the new fiscal year. The list has now been resumed.—Ed.

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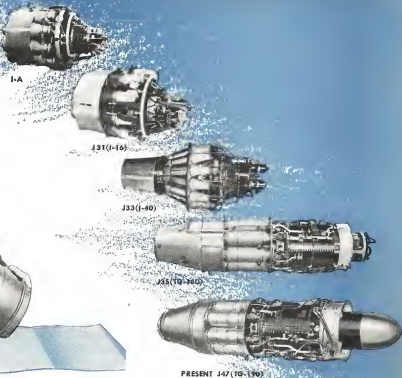
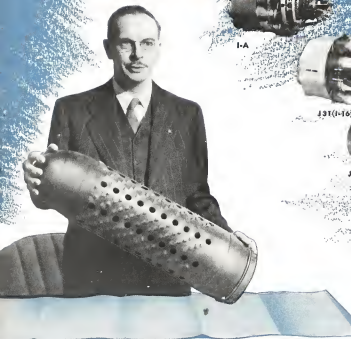
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He designed the I-A and I-16 engines which powered Bell's P-59—the first jet-propelled plane in the United States. He supervised the design of the I-40 engine—power source for Lockheed's F-80 "Shooting Star." In 1945 he took over further development of the J35 engine originally designed in Schenectady. Shortly after, he supervised design and development of the J47, one of the most powerful jet engines in production. The J47 furnishes power for North American's F-86 and B-45A, Boeing's B-47, Republic's XF-91, and supplements G-E turbosupercharged piston engine power in Convair's B-36.

Many G-E engineers such as "Truly" Warner are working today to provide new and better products for you and the aviation industry. Your nearest G-E representative will describe in detail the aviation products we engineer and manufacture. See him today. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

